

INTERMOUNTAIN STATION

Control Reference File

073

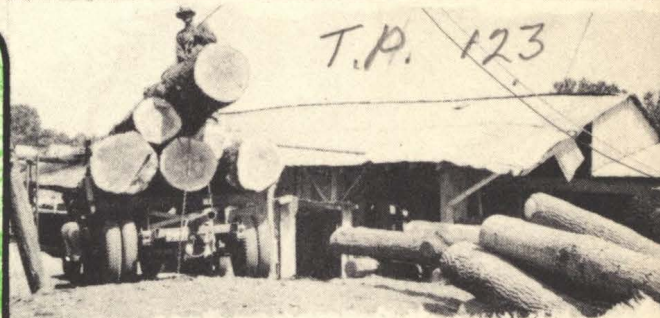
123



# MARKETING the FARM FOREST PRODUCTS of SOUTHERN ILLINOIS

*Teel Paper 123*

O. Keith Hutchison . . . Robert K. Winters





**MARKETING THE FARM FOREST PRODUCTS**  
**of**  
**SOUTHERN ILLINOIS**  
**by**

**O. Keith Hutchison and Robert K. Winters**

**Division of Forest Economics**

**Central States Forest Experiment Station**

**Technical Paper No. 123**



**Published by**  
**Southern Illinois University**  
**under**  
**a cooperative arrangement with the**  
**FOREST SERVICE, U. S. DEPARTMENT OF AGRICULTURE**  
**December 1951**

# MARKETING THE FARM FOREST PRODUCTS

of

SOUTHERN ILLINOIS

by

G. Keith Hutchison and Robert E. Winters

This report presents the results of investigations conducted under Title II of the Research and Marketing Act of 1946. The main purpose of the study was to find ways in which the development of markets and industries for wood products can contribute most to the long-time welfare of the people of Southern Illinois.

The authors wish to acknowledge the assistance of A. G. Chapman, R. D. Lane, R. K. Day, D. B. King, G. L. Schnur, K. L. Quigley, Lake Compton, and all other members of the Central States Forest Experiment Station, who helped in the preparation of this publication. They are also indebted for the assistance given by personnel of the Illinois Division of Forestry and the Shawnee National Forest; by faculty members of the Department of Forestry of the University of Illinois, and especially by the faculty members of Southern Illinois University.

Published by

Southern Illinois University

Urbana

a cooperative program with the

FOREST SERVICE U. S. DEPARTMENT OF AGRICULTURE

December 1951

## FOREWORD

Southern Illinois is vitally interested in its future welfare. It is, therefore, concerned with every development that will help raise the average income of its people, that will increase the returns from its land, that will reduce unemployment and the need for public aid.

Many civic leaders recognize the need for more industrial development in the area and are seeking ways to bring this about. It is natural, therefore, that they consider the extensive hardwood forests of the area and the possible new industries that can be developed to use them.

This report attempts to bring together the facts these leaders need in planning a program to develop forest industries. It briefly describes the economy of the area, pointing out the chief resources and the major occupations of the people. In more detail it describes the present markets and wood-using industries which use local forest products. It describes how these industries operate and what their annual wood requirements are.

In considerable detail, the report describes the present forest crop in terms of area, location, ownership, volume, species, quality, and growth. It compares the most recent growth and drain figures for this forest area, and discusses the conditions under which expansion of forest industries would be justified.

Lastly, the report recommends steps which should be taken to obtain more income for this area from wood products produced from local forests.

A handwritten signature in dark ink, appearing to read "H. J. Rehn". The signature is written in a cursive style with a large, stylized initial "H".

## CONTENTS

	Page
FOREWORD . . . . .	i
SUMMARY . . . . .	1
INTRODUCTION . . . . .	2
MARKETS FOR STUMPAGE, LOGS, AND BOLTS . . . . .	6
Sawmills . . . . .	6
Container Veneer Mills . . . . .	11
Box Mills . . . . .	13
Handle Mills . . . . .	14
Mine Timber Buyers . . . . .	14
Wood-Piling Buyers . . . . .	15
Pulp Mills . . . . .	16
Barrel Stave and Heading Mills . . . . .	17
Face-Veneer Mills . . . . .	19
Charcoal Kilns . . . . .	20
Post and Pole Buyers . . . . .	20
Fuelwood Buyers . . . . .	22
Concentration Yards . . . . .	23
THE TIMBER CROP AVAILABLE FOR MARKET . . . . .	24
Forest Area . . . . .	25
Forest Ownership . . . . .	27
Timber Volume . . . . .	28
Timber Growth . . . . .	32
Timber Drain . . . . .	33
Growth-Drain Comparison . . . . .	34
Allowable Cut . . . . .	35
RECOMMENDATIONS FOR IMPROVING THE MARKETING OF WOODLAND PRODUCTS . . . . .	37





## SUMMARY

The economy of Southern Illinois<sup>1</sup> relies chiefly on agriculture and the production of minerals. Farms cover over 70 percent of the land, employ about 30 percent of the labor force, and, based on value, produce about 20 percent of the products of this area. Mineral products account for approximately 60 percent of the value of products produced in the area, but only 18 percent of the labor force.

Although forests cover 26 percent of the total land area,<sup>2</sup> they provide less than 2 percent of the income. The forests of Southern Illinois can contribute a greater share of the income of this region through (1) better marketing of woodland products, (2) the labor required to produce a greater quantity of finished wood products rather than rough lumber, and ultimately, (3) a considerably increased annual timber cut made possible by improving fire control, by protecting the forests from grazing, and by improving woodland management practices.

Because farmers own about 80 percent of the woodland area, any plan to improve the forests, to be effective, must include the farmer. The farmer, in turn, will be able to increase his income, not only by growing and selling more timber, but also by harvesting the timber crop and marketing it more effectively.

The kinds of wood-using industries providing timber markets in Southern Illinois are: (1) sawmills, (2) container veneer mills, (3) box mills, (4) tight cooperage stave and heading mills, (5) charcoal kilns, and (6) concentration yards. In addition there are producers and buyers of: (1) mine props, (2) wood piling, (3) pulpwood, (4) face veneer logs, (5) posts and poles, and (6) fuelwood.

The 200 sawmills in Southern Illinois saw about 60 percent of the timber cut in this area. Most of them are portable and operate intermittently to supply local markets. About 30 percent of the timber cut is used by container veneer mills and stave and heading mills, industries that require high-quality timber. In addition, many logs and bolts are produced in Southern Illinois and shipped elsewhere for processing. More logs, bolts, and lumber should be processed in this area to increase local income and to stabilize sawmill operations. Industries that can and will use low-grade timber are also needed.

The woodlands of Southern Illinois support 2.6 billion board feet of timber 11 or more inches in diameter; only 20 percent of this saw timber<sup>3</sup> is of the high quality preferred by most mills. In 1947 the forests grew 103 million board feet of saw timber; only about 57 million board feet were cut. More than 27 million board feet of the saw timber cut was in high-quality logs (grades

---

<sup>1</sup>Southern Illinois as referred to here is the 16 southernmost counties of Illinois (see frontispiece).

<sup>2</sup>Current forest statistics used throughout this report were provided by the Forest Survey, Central States Forest Experiment Station.

<sup>3</sup>Hardwood trees 11 or more inches in diameter are classed as saw timber. Trees 5 to 11 inches in diameter are classed as pole timber. Tree diameters are measured at "breast height"—4½ feet above the ground—abbreviated, d.b.h.

1 and 2).<sup>4</sup> The stands grew only about 21 million board feet of this high-quality material in 1947. The gain, therefore, was mainly in low-quality timber which is difficult to market.

Much of this low-quality timber should be cut to make room for higher-quality growth. Because of this, any expansion of wood-using industries which will use low-quality timber will benefit the forests, even if the cut of such timber should far exceed the growth. Since industries using high-quality timber are already cutting more than the growth of this class of material, they should consider their needs to see if they can use lower-quality timber in some cases.

To improve the economy of Southern Illinois through better marketing of farm woodland products the following recommendations are made:

1. Increase local processing of lumber and local wood remanufacturing.
2. Develop new marketing facilities, such as concentration systems, "milk-route" pick-ups, and cooperatives, for logs, bolts, and lumber.
3. Expand markets for low-quality timber.
4. Encourage permanent wood markets through a dependable production of woodland products.
5. Provide more marketing information for the woodland owners, wood users, and wood remanufacturers.
6. Provide greater service to farmers, wood users, and remanufacturers through research and extension.

## INTRODUCTION

The forests of Southern Illinois can contribute more than they now do to the wealth of this part of the state. Twenty-six percent of the area is forested. Forest crops, like agricultural crops, are renewable and can be increased and improved by skillful husbandry. Forest crops, effectively marketed, can add to a farmer's or landowner's income, but adequate marketing facilities are not now available in this area.

The purpose of this report is:

1. To describe the principal kinds of forest industries in Southern Illinois.
2. To report the marketing practices of each kind of forest industry.
3. To describe the character and extent of the forest resources required by each industry.

---

<sup>4</sup>The rules used for log grades were adapted by the Forest Survey, Central States Forest Experiment Station, from "Interim Sawlog Grades for Southern Hardwoods," Southern Forest Experiment Station, 1946.



4. To show how much the markets for various forest products can be expanded in the light of the present and prospective timber resource.
5. To show how the farmers' income can be increased through this expansion and more effective harvesting and marketing of his forest products.

Southern Illinois is unquestionably the outstanding rural problem area of the state. In 1945 the average value per farm of products used and sold by farmers of Southern Illinois was 44 percent below the national average while for the rest of the state it was 75 percent above.<sup>5</sup> In 1940 only 70 percent of the labor force of this area was employed while in the rest of the state and the nation 86 percent of the labor force was employed.<sup>6</sup> In 1940 this area, with only 5 percent of the state population, had more than 9 percent<sup>7</sup> of the general assistance<sup>8</sup> cases in the state.

The economy of Southern Illinois is primarily built on the extraction of coal, oil, and other minerals, and on agriculture, as shown in the following tabulation:<sup>9</sup>

ACTIVITY	NUMBER OF PERSONS EMPLOYED (Thousand)	VALUE OF PRODUCTS PRODUCED (Million Dollars)
Agriculture	32	43
Retail, wholesale, and service	27	--
Mining	19	122
Manufacturing (other than forest products)	9	39
Forest industry	2	3
Other	18	--
	<u>107</u>	<u>207</u>

<sup>5</sup>U.S. Bureau of the Census. Census of Agriculture. Washington. 1945.

<sup>6</sup>U.S. Bureau of the Census. Statistical abstract of the United States. Washington. 1947.

<sup>7</sup>Information concerning public assistance in this report was obtained from the Illinois Public Aid Commission.

<sup>8</sup>Aid to needy persons, excluding for the most part the aged, the blind, and children.

<sup>9</sup>Sources used in compiling this tabulation include: U.S. Bureau of the Census. County data book. Washington. 1940; U.S. Bureau of the Census. Census of manufactures. Washington. 1947; U.S. Bureau of the Census. Census of agriculture. Washington. 1945; Department of Mines and Minerals. Coal report of Illinois. Springfield. 1947. Because these sources give data for various years between 1940 and 1947, the tabulation expresses the relative importance of activities during that period.

Of the minerals, coal is by far the most important. Southern Illinois produces nearly 50 percent of the coal mined in this state,<sup>10</sup> the fourth largest coal-producing state in the nation. The five counties, Franklin, Saline, Williamson, Perry, and Jackson, which produce most of the coal in this 16-county area, are a special social problem area. They contain 53 percent of the population of Southern Illinois and from 1936 to 1946 accounted for 65.5 percent of the cases receiving general assistance in that area.

Petroleum production, a relatively new industry, is important in White, Hamilton, Gallatin, and Franklin Counties. Hardin and Perry Counties produce about 50 percent of the nation's fluor-spar and get lead and zinc as byproducts. Limestone production is important in Randolph, Union, Johnson, Hardin, Massac, and Perry Counties. Other minerals mined in Southern Illinois include building stone, road ballast, agricultural lime, silica, sand and gravel, fuller's earth, clay, and shale. The lime is used for soil building in all the counties of the area.

Mineral production often causes a local inflation which lasts only until the deposit is worked out. Because workers, lured by high wages, tend to flock to the mines, successful farm and forest enterprises are hard to maintain. Many acres of forest land cannot be harvested, partly at least, because of high wage rates.

Agriculture is the second most important industry in Southern Illinois, based upon the value of products produced. It is generally most successful, and is the main support of the economy, in the counties bordering the Wabash, Ohio, and Mississippi Rivers. In these counties farms are larger and subsistence farming is less common. The relatively flat, poorly drained plateau that makes up the coal-producing area is poorer for farming, and the economy depends mainly upon mining. Partly because of the part-time nature of mining, many miners live on farms. These farms, operated for subsistence, tend to be smaller than those in the riverborder counties.

Land use in the Southern Illinois counties is gradually changing. Although the poorer upland soils are being abandoned and are returning to forests, the productivity of the better upland soils is being increased through improved farm practices. The bottomlands are being drained and cleared for farming.

Manufacturing does not support the economy of this area to the extent that it does in other parts of the state. There is an average of 20 manufacturing plants per county in Southern Illinois whereas the remaining counties of the state, excluding Cook County--the Chicago area--average 52 plants.<sup>11</sup> The plants in this area are also smaller, averaging 34 employees per plant compared to 87 for the rest of the state, again excluding Cook County. In 1947 the value added to goods through manufacturing amounted to about \$122,000 per plant in Southern Illinois compared to \$472,000 per plant for the rest of the state, Cook County excluded.

While Southern Illinois is not now an industrial area, it has many advantages which should be attractive to industry. Transportation facilities--water, rail, and highway networks--are excellent. Power plants are now being built to increase the power available to this area. A wide

---

<sup>10</sup>Department of Mines and Minerals. Annual coal reports. Springfield.

<sup>11</sup>U.S. Bureau of the Census. Census of manufactures, 1947. Washington. 1949.



variety of raw materials, including mineral, agricultural, and forest products, are produced here. The area has an over-supply of labor, much of which was readily trained by industry during World War II.

Though 26 percent of the land area of Southern Illinois is forested, less than 2 percent of the value of products produced in Southern Illinois comes from the forests. If the forest resources are to contribute more to the wealth of Southern Illinois, local forest industries must expand and increase their use of local wood products, and the farmers, who own an estimated 80 percent of the forest land, must learn to manage, harvest, and market their timber crop more effectively.

Farmers now receive help and encouragement in developing their woodlands through the Farm Forestry program sponsored jointly by the State and Federal Governments under the Norris-Doxey Act of 1937. However, the present program is far too small to provide all the assistance being asked for in Southern Illinois and should be enlarged to provide assistance for all woodland owners. This need may be met by the recently enacted cooperative Forest Management Act of 1950 which will supersede the Norris-Doxey Act on July 1, 1951. This new act authorizes cooperative federal and state technical services for all private forest landowners, timber operators, and wood processors, nonfarm as well as farm.

The industries which now provide markets for forest crops are scattered throughout Southern Illinois. The operation of each of these industries and the market each provides are described more fully in the following pages.

## MARKETS FOR STUMPAGE, LOGS, AND BOLTS<sup>12</sup>

### SAWMILLS

**Importance.**--Sawmills are the most numerous of the wood-using plants, and because of their abundance and wide distribution (fig. 1), they are the most convenient market for standing timber (stumpage) and logs. They use a greater volume of timber than all other wood-using industries in this region combined. More than 35 million board feet of Southern Illinois timber were cut into lumber in 1947 by about 200 sawmills operating intermittently throughout the area. Most of these were small, portable, circular-type sawmills operating with from two to eight men. Only about 10 mills can be considered as strictly permanent commercial sawmills with a reasonably large annual lumber production. Two of these are band sawmills that can cut lumber more accurately with less waste. Not more than 60 mills in the area cut 200,000 board feet or more in 1947.<sup>13</sup>

**Specifications.**--Sawmills of this region, both permanent and portable (fig. 2), usually want logs in even 2-foot lengths from 8 to 18 feet long and not less than 8 inches in diameter. Two to four inches should be added to the length of each log to allow for trim. Logs should be straight with the limbs trimmed close to the main stem and be over 50 percent sound.

Some mills have log-grade specifications but these vary with each operator. Where grade specifications are used, the best price is paid for large logs, 16 or more inches in diameter at the small end, that are straight, free of knots, and free of such defects as rot, worm holes, shake, and stain. Operators who buy logs at the mill usually use the Doyle or Doyle-Scribner scale to estimate the amount of lumber that can be sawed from them.

**Buying methods.**--The permanent mills provide the steadiest market for stumpage and logs. Most of these buy stumpage of all species; some buy delivered logs of all species and a few buy both stumpage and logs. In general, the permanent mills are equipped with efficient power units and head rigs, and supplementary equipment such as edgers, cut-off saws, and planers. This equipment enables them to produce well-manufactured lumber, air-dried, graded, and finished to standard specifications. The higher grades find a ready outlet in the national lumber market.<sup>14</sup> Most of these mills have found or developed uses for low-grade lumber; much of it goes into flooring, machinery parts, grain doors, and rip-rap. Most of them are located in counties bordering the Ohio and Mississippi Rivers and draw stumpage and logs within a radius of about 30 miles.

The portable sawmills provide a more seasonal market for stumpage and logs. Although they usually do not operate steadily and handle smaller amounts of stumpage and logs than do the

---

<sup>12</sup>Bolts are short pieces of wood, round or split, used for manufacturing such products as shingles, staves, container veneer, boxes, and pulp.

<sup>13</sup>U.S. Bureau of the Census. Census of manufactures. 1947. Washington. 1949.

<sup>14</sup>National market as used here refers to the large wholesale systems which supply standard grades of hardwood lumber to manufacturers and other users throughout the nation.



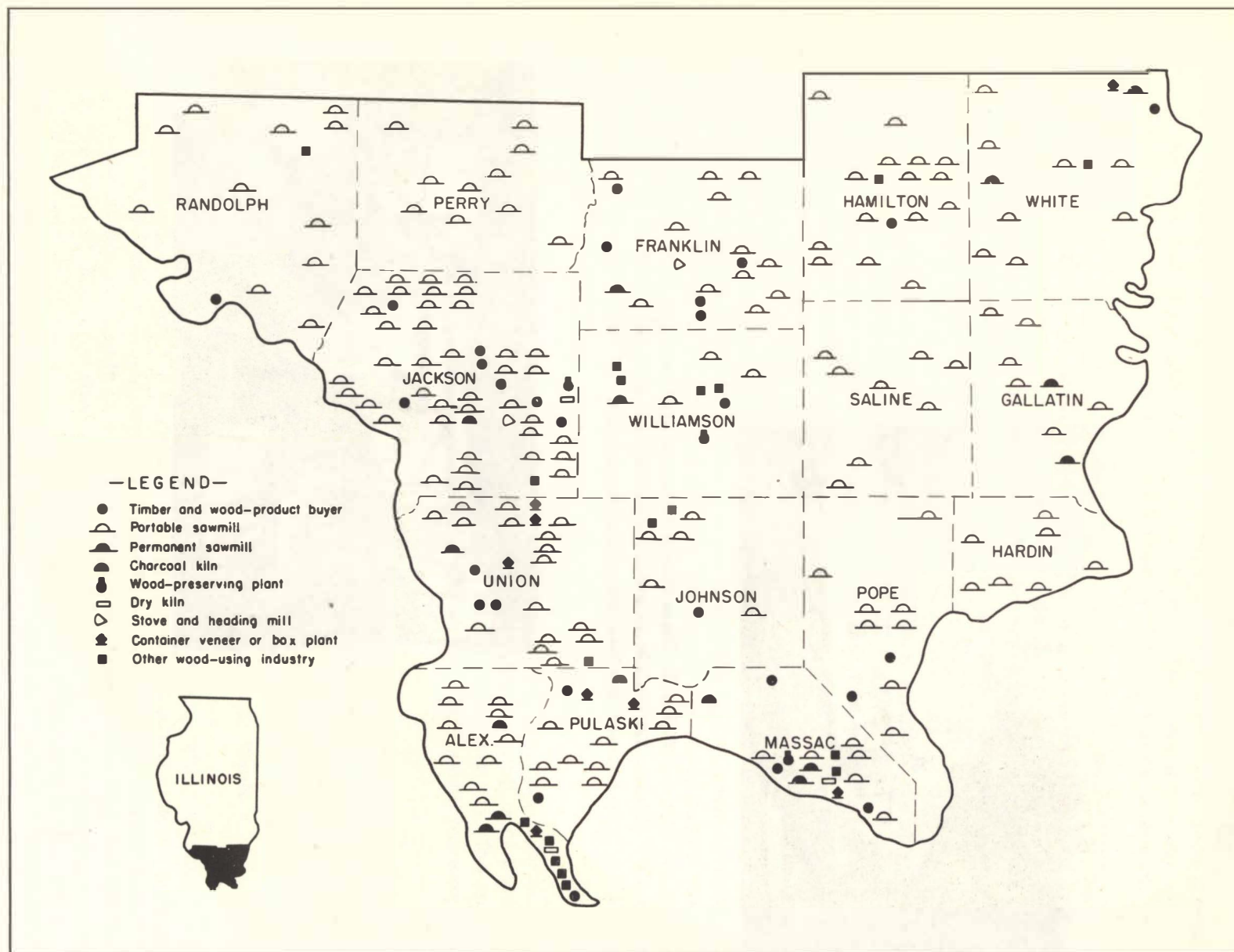
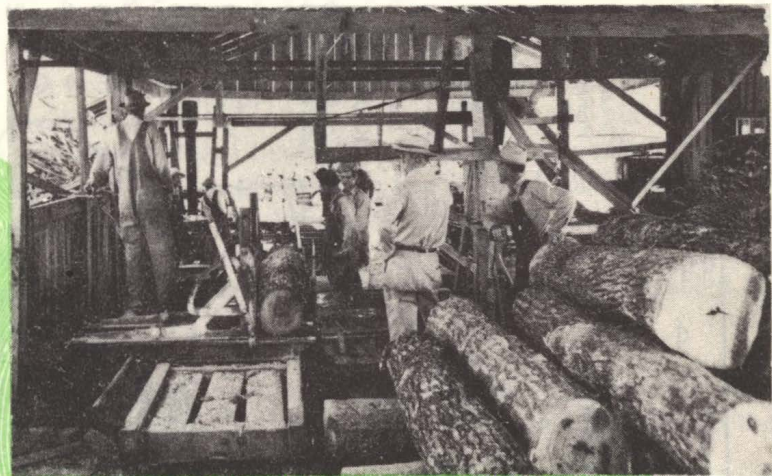


Figure 1. Wood-using plants are scattered throughout Southern Illinois.



Figure 2.-- These sawmills are typical of the region. The top picture shows a temporary, farmer-owned mill; the lower one, a commercial plant.





larger, permanent mills, they often are a more convenient market for the farmer with a small woodlot. These mills often set up to cut as little as 10 thousand board feet. Sometimes the farmer furnishes part of the labor required to run the mill. The operator may buy the stumpage, or he may cut the timber for a share of the lumber. Various business arrangements are worked out.

The typical portable mill in this area is set up on a temporary foundation with a partial shelter either in the woods or beside a road a short distance from the timber supply. The mills are not well enough protected to operate during the severest winter weather. They usually operate with a 30- or 40- horsepower gasoline or diesel motor and may or may not have supplementary processing equipment such as edgers and trimmers.

For the most part these portable mills are not powered, equipped, nor operated to process lumber to standard specifications. Their output is small, and they do not have enough capital to enable them to stockpile lumber. So, during normal times, if lumber processed by these mills goes into the national market, it must be sold to a concentrator who air-dries, grades, and finishes it to meet standard specifications.

Marketing facilities, such as concentration yards or cooperatives which could stockpile lumber and place it on this wider market, are not available to most small sawmills. For this reason, most portable mills cut for local markets. About half of them do custom sawing. Some do custom sawing only, while others buy stumpage or logs as well. Some only cut to fill orders for the coal mines and local farm and construction needs. Still other portable mills are strictly non-commercial, being owned by farmers and operated only a few days each year to fill their own and their neighbors' needs.

More and more sawmill operators are buying timber that has been marked for harvest rather than all that they can get from an entire woodland. Operators who get all or part of their timber from the Shawnee National Forest are accustomed to buying timber this way. The farm forestry program, which is active in this area, is gradually introducing other sawmill operators to marked timber sales.

Because sawmills buy such a large amount of the timber sold in this area, the market for the farmers' stumpage and logs is strongly influenced by the market for sawmill products. The income of the operators in this area depends mainly upon the production of unfinished lumber, and of mine timbers, ties, and bars. Although a number of wood-preserving plants in the area process railroad cross ties, only a few of the sawmills cut them. Cross ties usually are not worth as much in this area as mill-run lumber produced from the same timber.

In the fall of 1949 the sawmills, both portable and permanent, within trucking distance of the Ohio-Mississippi-Wabash River areas and especially within trucking distance of Metropolis, Cairo, and Cape Girardeau, were most active. They had outlets to the national market through local concentrators as well as to local wood-using manufacturers, contractors, and farmers. Mills in the northern and interior counties were not generally so active. Their markets, depending as they do on local farm construction and on coal-mine and oil-field needs, were more seasonal. These users need only unfinished lumber of mill-run or poorer grade. Local concentrators finishing lumber for the national market and manufacturers using local wood were seldom available as markets.

Wage rates also influence the market for stumpage and logs. Where hourly wages are comparatively high, as they are around oil fields and coal mines, the cost of producing logs and bolts is so great that wood-using industries producing low-valued products cannot operate.

Competition of several wood-using industries for the same or similar stands of timber, though each may be after wood of a different quality, also affects the market for stumpage and logs. An active market for high-valued wood products, such as veneer logs and stave bolts, for example, may so inflate the woodland owner's notion of the value of all his stumpage that industries using low-valued products cannot operate profitably. The stumpage and logs he can sell will return a high price, but the quantity may be small.

The sawmill industry, and the market for stumpage and logs, might be stimulated if locally produced lumber were processed or remanufactured in Southern Illinois. In 1940 Illinois ranked seventh in the nation with respect to the amount of wood used in manufacturing.<sup>15</sup> Though this is a hardwood-producing state, it imports about 75 percent of the hardwood lumber it uses (fig. 3).

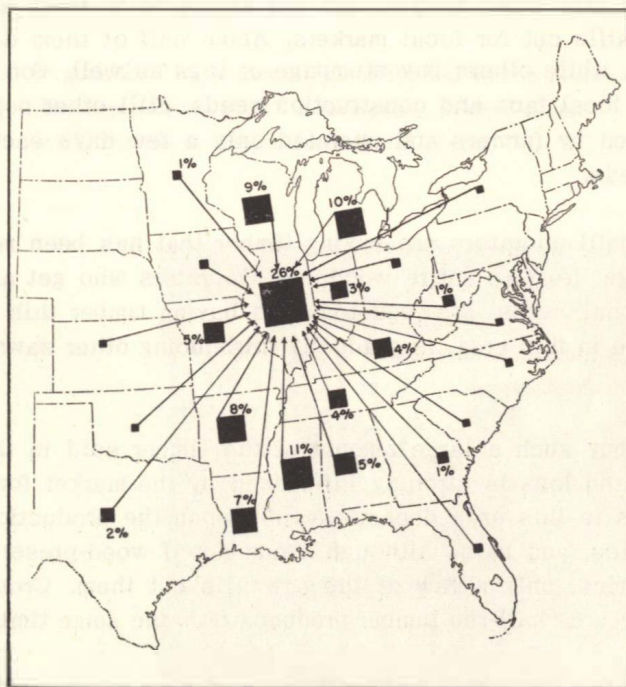


Figure 3. In 1943 Illinois imported 74 percent of the hardwood lumber it used. Much more of its needs could be supplied by local forests.

<sup>15</sup>U.S. Forest Service, Census of wood used in manufacture. Washington. 1940.

In Southern Illinois only six plants are known to be using hardwood lumber or dimension stock in manufacturing. Of these, three are importing most of their lumber. Some of the principal reasons for this are: (1) mills in other states are able to produce the lumber more cheaply, (2) many small sawmill operators of Southern Illinois do not produce the quality of lumber demanded by most remanufacturers, and (3) most small sawmills of Southern Illinois do not produce a dependable supply, and facilities to pool their production to furnish a dependable supply are not available.

**Desirability of the market.**--Woodland owners are often advised to sell their timber for a variety of high-valued products, depending upon what each tree is suited for. They may have a few trees with logs suitable for veneer or with bolts suitable for cooperage and other specialties while the bulk of the stand is best suited for sawlogs. Although sawmills usually do not pay the highest price for individual trees, they usually buy the greatest volume of wood from a given woodland and may be the best over-all market. If the choice trees have already been removed for other uses, sawmill operators may not be interested in the remaining stand. The woodland owner should consider this point before any sale is made and compare the advantages and disadvantages of selling more wood to a sawmill at a lower per-unit rate against selling less wood at a higher per-unit rate. Sales that allow high-grading (removing only the high-quality trees) may give immediate high returns, but repeated high-grading results in a stand made up of low-quality, hard-to-sell trees. To rehabilitate these high-graded stands, the owner must go to considerable expense to remove the undesirable trees so that more desirable trees can be established and even then must wait many years for high-quality timber to grow.

## CONTAINER VENEER MILLS

**Importance.**---Nine plants in and near this area are equipped to produce rotary veneer and to manufacture various kinds of bushel and market baskets, berry and fruit boxes and crates, and egg cases (fig. 4). A tenth plant buys veneer and manufactures containers. These mills provide the second most important market for stumpage and logs. Nearly 10 million board feet of Southern Illinois timber were used by this industry in 1947. Though these mills use less sawlog volume than sawmills, they require logs of better quality and can pay more for high-quality stumpage and logs than the sawmills.

The local fruit and berry industry, which requires shipping crates, baskets, and boxes, is an important outlet for the products of the container veneer plants. However, stiff competition in recent years from improved fiber containers and from wood containers produced elsewhere has retarded the local industry. Containers produced as far away as Mexico, California, and New Jersey compete with those produced in Southern Illinois. Producers of egg crates have especially suffered because of new methods of handling and storing eggs.

**Specifications.**---For making container veneer, producers want soft hardwoods including cottonwood, yellow-poplar, gum, soft maple, elm, sycamore, and willow. A few operators who run sawmills in conjunction with their veneer mills buy all species. Lengths of logs taken range from 6 to 18 feet with a trimming allowance of 2 to 4 inches, depending upon the plant.



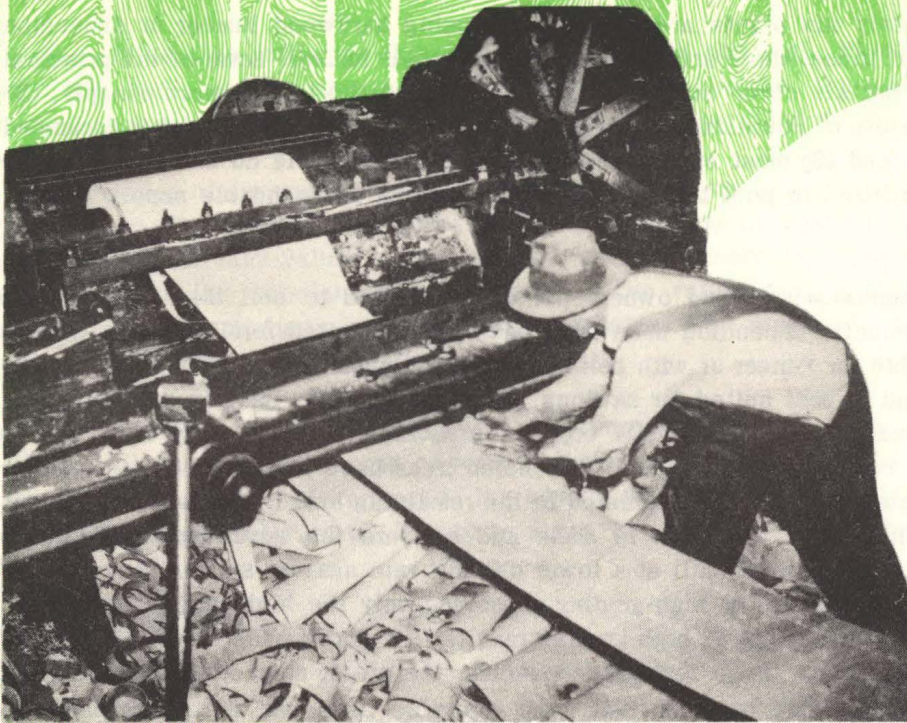
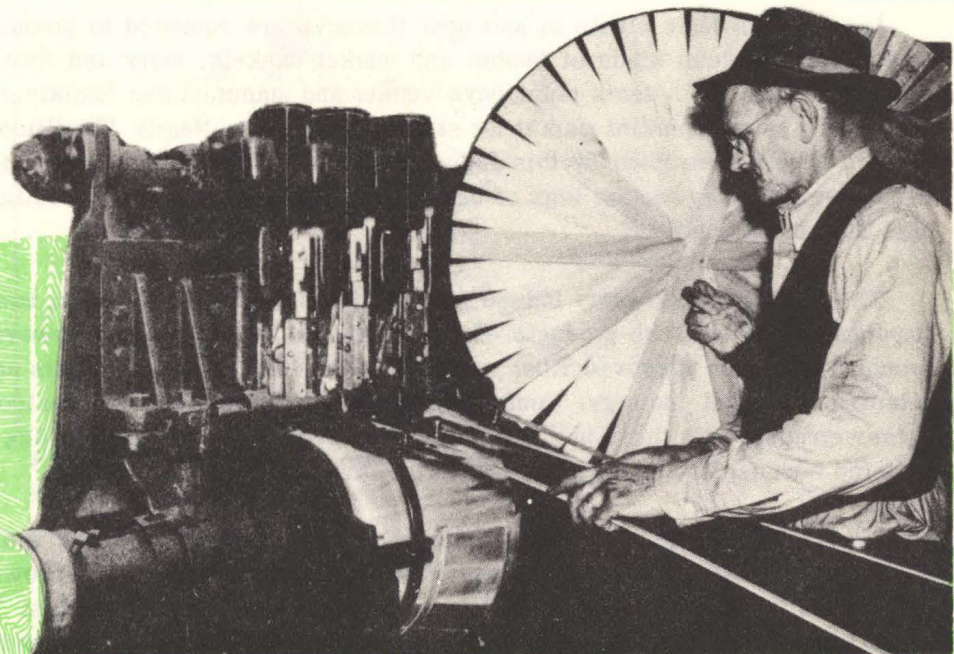


Figure 4.--Making veneer containers is an important industry in Southern Illinois. Veneer is cut from bolts (top) and assembled into containers (bottom). (Bottom photograph courtesy of Department of Forestry, University of Illinois)





Some veneer mills accept a few logs smaller than 14 inches in diameter at the small end but all prefer larger logs. Logs 16 inches and larger in diameter that are clear of knots and other defects bring the highest prices. Because logs are reduced at the mill to bolts ranging in length from 18 to 65 inches, even rough logs may be used if they are large and the knots are widely spaced. Most veneer mills have some system of grading for determining the quality of each log purchased. Grade specifications commonly include such factors as species, log length and diameter, straightness, knots, rot, shake, and splits.

**Buying methods.**--These mills buy a large portion of their logs delivered at the mill from within a radius of 40 miles.<sup>16</sup> The mill operator grades the logs according to his own specifications of species, length, diameter, and clearness, and usually pays for them by the Doyle scale. Only two companies buy stumpage and operate their own woods crews; most operators prefer to buy logs delivered at the mill.

**Desirability of this market.**--In 1949 logs delivered at the veneer mills averaged about \$45 per thousand board feet. Anyone owning bottomland or mixed hardwood timber of large sawlog size should certainly consider this market. While this is not the only industry that pays a high price for soft-hardwood stumpage and logs, it may be the closest and most suitable for many stands of timber. Some sawmill operators, especially those that purchase stumpage, profit by sending the better soft-hardwood logs to veneer plants and operating the sawmill on the other hardwoods.

In considering the crop to be grown on bottomlands, this market should be kept in mind. Well-managed soft hardwoods on bottomland sites will grow 750 to 1,000 board feet per acre per year and are less likely to be destroyed by floods than are annual crops.

## BOX MILLS

**Importance.**--Four mills in this area make boxes and crates from sawed material. One plant cuts and sells box shooks<sup>17</sup> and assembles boxes. This plant used logs of all species but prefers the soft hardwoods. For the most part these industries are small and do not furnish wood-land owners a large market for logs and stumpage.

**Specifications.**--These plants can use low-quality logs and lumber but pay low prices for it. Logs of woods-run grade are used, that is, logs just as they are produced from the stand with the cull logs removed. Actually, because the logs are reduced to box-shook lengths and cut up with small saws, logs too crooked and too small for sawmills can be used by some of these plants.

**Buying methods.**--One plant making beverage cases buys stumpage and operates its own portable sawmill. Another plant, also making beverage cases, buys the lumber it uses.

---

<sup>16</sup>Walters, C.S. The Illinois veneer container industry. Ill. Agr. Expt. Sta. Bul. 534. 1949.

<sup>17</sup>Shooks are sets of pieces of lumber cut to size for box manufacture, bundled together, but not yet assembled.

**Desirability of this market.**--Because these operations can use low-quality logs, they may offer an outlet for some material that other industries pass up. However, because the quantity of wood used is small, only nearby timber producers will be interested in this market. These industries should be expanded to use more of the low-quality wood available in this area.

## HANDLE MILLS

**Importance.**--Only two plants in Southern Illinois buy stumpage, logs, or bolts for handles. One mill, operated intermittently in conjunction with a sawmill, cuts blanks for making all kinds of brush, striking-tool, and fork and hoe handles. The blanks are then shipped elsewhere to be manufactured into finished handles. The other plant manufactures brush, and fork and hoe handles.

**Specifications.**--The operator making handle blanks buys woods-run quality stumpage and logs of all species. The brush, and fork and hoe handle manufacturer purchases ash and beech bolts. These bolts must be clear, 56 inches long, and have a minimum top diameter of 8 inches.

There are larger markets for hickory, ash, and oak handle bolts in adjoining states where larger numbers of handles for striking tools and farm tools are made. The largest demand is for clear bolts, 40 inches long, with a minimum top diameter of 12 inches.

**Buying methods.**--Most wood used for handle stock is purchased in bolt form at the plant. A few plants may buy the wood in log lengths delivered at the plant. A number of methods are used to measure wood purchased for handles. If the wood is purchased in bolts less than 6 feet long, it may be measured by the cord (either short, standard, or long), by the diameter-foot,<sup>18</sup> or by some other unit.<sup>19</sup> If the wood is purchased in log lengths, it is measured and paid for by log scale, usually by the Doyle log rule.

**Desirability of this market.**--It would be desirable for Southern Illinois to have a larger market for handle-stock wood. Much of the wood, especially the second-growth hickory, being grown on woodlands of this area is well suited to this use but is difficult to market for any purpose.

## MINE TIMBER BUYERS

**Importance.**--The coal mines of Southern Illinois provide one of the largest markets for round wood of pole size. In 1947 these mines used nearly one-third of the pole-sized timber cut in Southern Illinois. This amounted to about 936,000 cubic feet, the equivalent of about 6 million board feet.

---

<sup>18</sup>A diameter-foot is one foot measured across the diameter of the bolt, usually at the small end.

<sup>19</sup>Peck, Ralph H., Sechrist, William C., and Leach, Willard C. Marketing Missouri farm timber crops. Mo. Agr. Expt. Sta. Bul. 460. 1943.



**Specifications.**--The amount of wood wanted, and the diameter and length of the props used, varies greatly with the mine. Props may vary in length from 3½ to 10 feet or more and are used with the bark on. Most props are 4 or 5 inches in top diameter though larger ones are also used. Oak makes up over 70 percent of the round wood purchased by the mines; hickory, elm, ash, and sycamore are used occasionally.

**Buying methods.**--Most of the round mine timbers produced in Southern Illinois come from the coal-mining area. The mines or "jobbers" buy stumpage, or props delivered at the mines or at any convenient loading point. Some mines produce props from their own land; others buy props delivered at the mine. Still others have contracts with producers to keep them supplied with the wood they need. Producers of mine props want even-aged pole stands of oak which can be clear cut.

**Desirability of this market.**--Though the mines of Southern Illinois provide a market and a number of buyers are available, the profit from producing mine props is so small that this area does not produce many. In 1947 nearly 70 percent of the wood used in Illinois mines came from Missouri. Since then the trend has been toward a greater use of local timber.

Prices for props vary according to the size of the prop and the location of the purchasing mine. Props 8 feet long with a 4½ inch top diameter have been bringing 25 to 35 cents delivered at the mines. To gain the most profit, operators generally produce mine props from dense pole stands on pin oak flats. Generally, the production of props from upland timber yields a very low profit, because labor costs increase in the shorter and more scattered timber.

Because commercial operations generally clear cut the land, this market is not attractive to many woodland owners. However, this should be a desirable market for those woodland owners interested in thinning their stands to allow more rapid growth of high-quality trees.

## WOOD-PILING BUYERS

**Importance.**--The market for local wood piling is small but important. Though only about 545,000 board feet of timber were cut for piling in Southern Illinois in 1947, most of this came from pin oak stands which presently have little value for anything else. This production of hardwood piling is insignificant when compared to the large volume of treated southern pine piling that is imported. However, pin oak and hickory piling generally does not compete with treated pine piling. It is not treated and is usually used for temporary structures and footings for buildings.

Oak sold for piling usually brings a good price compared to other uses for which the tree might be sold. Water oak (pin oak), which is common on the bottomlands and poorly drained sites of this region, is in greatest demand for piling. Some hickory is also used if it meets specifications. The trees must be straight and sound but may vary considerably in diameter and length depending upon the contracts to be filled.

**Specifications.**--Piles vary from 8 to 60 feet in length with a top diameter of 4 to 16 inches. Piles ranging from 20 feet long with an 8-inch top diameter to 50 feet long with a 6-inch top diameter are more in demand.

**Buying methods.**--A number of piling buyers and producers, often representing wood-piling companies, buy stumpage from woodland owners in this area. Some piling producers also operate portable sawmills, which enable them to buy entire stands of timber. The piles are cut to the desired length in the woods, skidded to a central loading point where they are hand peeled and carried by truck to a rail shipment point. Piles are usually purchased and sold by the lineal foot. However, lump-sum sales are also common.

**Desirability of this market.**--This is a good market to investigate, especially if the woodland contains pin oak of large pole or small saw-timber sizes. Pin oak sawlogs produce lumber of such poor quality that sawmills cannot afford to pay much for them. However, many of the tree defects which lower the grade of lumber do not degrade the same tree when cut for piling.

## PULP MILLS

**Importance.**--Though there are no pulp mills in this area, about 672,000 cubic feet, the equivalent of over 4 million board feet, of soft-hardwood timber was cut for chemical pulpwood in Southern Illinois in 1947. This wood was shipped to out-of-state pulp mills which provide a small but steady market for peeled pulpwood of soft-hardwood species.

Another market for wood of pulpwood quality and size is provided by the manufacturers of wallboard, container board, insulation, felt, and building paper. Wood for these purposes is purchased in the form of unpeeled bolts and is mechanically converted to wood chips. While no chipped wood has been produced in Southern Illinois since 1947, many plants manufacturing products from straw are now considering converting to chipped wood. In some cases the chips will be produced from mill waste instead of round bolts cut for that purpose.

**Specifications.**--Cottonwood and willow are preferred for chemical pulpwood though soft maple, box elder, and other soft-hardwood species can also be used. Pulpwood bolts are cut in 5-foot lengths with a minimum and maximum diameter of 3 and 15 inches. The bolts must be sound, without large knots, and small knots must be trimmed close to the stick. Before being shipped, bolts are peeled and air-dried for 60 to 90 days to reduce shipping weight.

Pulpwood bolts produced for mechanical chipping range from 3 to 10 inches in diameter and from 4½ to 5½ feet in length. Soft-hardwood species are preferred though some companies use all but the hardest of local woods (osage-orange and black locust). Pine can also be used, but very little of it is available in Southern Illinois.

**Buying methods.**--Most of the chemical pulpwood is produced in a few counties bordering the Ohio and Mississippi Rivers where several buyers are located. These buyers operate somewhat as concentrators, buying various products which normally are produced in small quantities by farmers and other small woodland owners, until carload lots for rail shipment are assembled. They buy either stumpage or peeled pulpwood bolts and pay for the wood by the cord.

Producers of wood chips used for making wallboard, container board, insulation, felt, and building paper, purchase bolts by the ton.



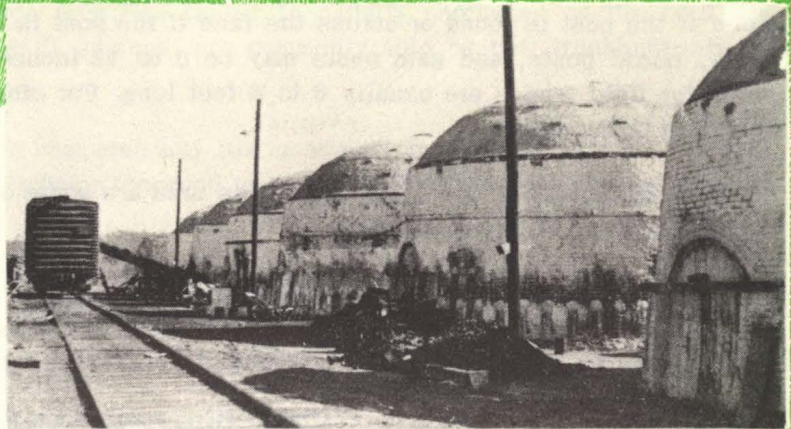


Figure 7.--The twenty charcoal kilns like these (top) located in Southern Illinois provide a small market for low-quality bolts, sawmill slabs, and stave-mill edgings (bottom)





**Specifications.**--Post specifications vary with the species of timber and with the use to which the post will be put. Line posts for field fences vary from about 2½ to 6 inches (in diameter if the post is round or across the face if the post is split) at the small end, while corner posts, corral posts, and gate posts may be 8 to 12 inches in diameter at the small end. Line posts for field fences are usually 6 to 8 feet long. For other uses the post lengths are usually specified in the order.

Over 80 percent of the posts cut in this area are white oak. More than half of these are produced from trees of saw-timber size.

Next in order of importance are black and red oak posts which are usually cut from saplings and pole-sized trees. Only a small number of locust and redcedar posts are produced in Southern Illinois because these species are scarce and not uniformly distributed in the area.

Pine poles handled by the wood-preserving plants must meet the specifications of the American Standards Association or some other agency.

**Buying methods.**--Whether posts and poles are purchased as standing timber or as the finished product, they are usually paid for by the piece. The price varies with the diameter, length, and species of the post or pole.

**Desirability of this market.**--The woodlands of an agricultural area, such as Southern Illinois, are expected to provide the fence posts for the farm. This is done without benefit of an organized market. Posts split from white oak saw timber are likely to be rather expensive considering the potential market value of the timber. The post producer ordinarily selects the high-quality trees in order to get timber that will split easily. The high-quality wood in such posts, not including the cost of making the posts, might be worth \$0.30 to \$0.40 if the trees are large enough to use for stave bolts or face veneer. The stumpage value of post timber may range from 2 to 8 cents or more per post depending upon the species and the size of the post. An organized industry may be able to produce, for the same or less cost, a more durable post (if treated with a preservative) from lower-quality timber than is now being used. Such an industry would be desirable.

As more and larger pine plantations are developed in Southern Illinois, a local market for pine posts and poles will become more desirable.

## FUELWOOD BUYERS

**Importance.**--Though a considerable amount of wood is still used for fuel in this region, there is no organized market for it. Most of the fuelwood is produced by farmers for their own use or is cut from sawmill slabs or stave-mill edgings. Of nearly 77,000 cords of fuelwood used in this area in 1947, only 41,000 cords came from live trees. Over 15,000 cords were cut from dead timber and 20,000 cords were byproducts, such as sawmill slabs and stave-mill edgings.

**Specifications.**--Usually there are no strict specifications for fuelwood. The hardwood species, including the oaks, hickories, and ash, are generally preferred. The wood should be reasonably sound and cut to stove length, usually about 16 inches.

**Buying methods.**--Fuelwood made from live timber is usually purchased by the cord. By-products (sawmill slabs and stave-mill edgings) are commonly sold by the truckload--all the purchaser can pile on.

**Desirability of this market.**--The comparatively low cost and convenience of gas, oil, coal, and electricity have reduced the market for fuelwood to the point that the production of wood for fuel is not an attractive industry.

There seems to be a better possibility of producing fuelwood for fireplace use in the larger cities. Used in this way, the wood becomes a luxury item and brings a better price.

## CONCENTRATION YARDS

A concentration yard buys wood products, further processes them, or holds them until it has enough to make an advantageous sale. For example, a concentrator may buy mill-run lumber from a number of small sawmills. The lumber is graded, sorted, and piled for air-drying in order to build up an inventory of various grades and species of lumber. The concentrator can then handle relatively large orders for specified lumber grades. The small sawmill operator with limited production and small capital is unable to do this.

**Importance.**--Five yards concentrate logs and lumber and buy stumpage in or near Southern Illinois. Three of the yards buy logs and lumber of all species. Another buys stumpage and lumber or dimension stock of all species. The fifth buys only lumber. During the war years, the market for logs and lumber was so active that these products by-passed the concentrator and were sold directly to the consumer or manufacturer. The reopening of these yards indicates a trend toward the marketing practices that existed before World War II.

**Specifications.**--Specifications vary with each concentrator and the products he handles. Logs may be purchased on a woods-run basis or by grade. Grade rules are not standard but the operator usually considers the species, length and diameter of the log, and the character, size, and number of defects (knots, rot, shake, and sweep).

Lumber can be of varying lengths and widths but must be well manufactured to meet the grade rules of the National Hardwood Lumber Association. Some operators want only oak lumber while others buy all commercial species.

**Buying methods.**--Both logs and lumber are purchased delivered at the yard. Logs are paid for by log scale on either a woods-run or grade basis. Lumber is measured and graded at the yard and paid for by grade. Because the concentrators keep a close check on the current hardwood log and lumber market, they may change their quoted prices often.

**Desirability of this market.**--If a sawmill operator can manufacture lumber to meet the grade rules of the National Hardwood Lumber Association, and if he can produce more than he can sell locally, he should investigate the possibility of selling to a concentration yard. However, if he can only produce poorly manufactured lumber, he probably can get more for it locally on a mill-run basis than a concentrator can pay for it as graded lumber.



Concentration yards do not necessarily pay higher prices for the products they handle, but they may divert more wood to its highest use and create a steadier market. For example, the concentrator can afford to sort out logs suitable for such products as veneer, staves, and handles, and can sell these logs in truckload or carload lots.

On the other hand, the small sawmill operator is ordinarily unable to do this because it takes him too long to get together enough high-quality logs or lumber. His mill-run lumber contains some high-quality lumber which could be diverted to a higher-paying market if he could accumulate enough. Because concentration yards sell hardwood lumber on a national market--often directly to the users and larger buyers--small sawmills supplying the yard have a wider and a steadier market than those supplying only a local need.

Concentration systems that can serve the farm woodland owner to the best advantage are not available. It would be desirable to have concentration systems, which could handle a variety of round and split products as well as lumber, well distributed throughout the 16 counties. They would provide convenient markets and enable woodland owners to sell more readily small quantities of products from harvest or improvement cuttings. These yards should be able to accept such products as fence posts, pulpwood, mine props, sawlogs, veneer logs, stave bolts, and handle bolts even in small quantities. After enough of a given product was assembled, it would be sold to the best available market.

### **THE TIMBER CROP AVAILABLE FOR MARKET**

The preceding section has described the present wood markets in Southern Illinois--their importance, wood specifications, buying methods, and desirability as wood markets. There is a lack of local industries to use some forest products. Because some products are shipped out of the area for further processing, local labor is not used to the fullest extent. Also, much of the local wood-using industry operates intermittently.

Because of the need to employ more of the labor available in Southern Illinois, some civic leaders have suggested that more wood products should be produced and manufactured locally. For the long-range good of Southern Illinois and for the immediate good of industries which might be induced to set up in this area, the volume and character of the present and future forest crop should be carefully considered. Industries which will require local wood supplies should not be invited unless they can be sustained with products from local forests. To find out if it is practical to expand present wood-using markets and to introduce new wood-using industries we must consider five questions:

- 1. How much area is in forests and is this area likely to remain in forests?** New wood markets or wood-using industries are more likely to become established where forest areas are stable or increasing.
- 2. Who owns the forest area?** Wood-users must depend upon woodland owners for a wood supply. Also, many problems of marketing forest crops and of securing adequate wood supplies for industries are related to type of ownership.

3. **What is the volume of wood in the present stands that various industries can use?** Because wood-using industries have various requirements as to species, size, and quality of the wood, the volume of timber must be considered by species or species groups, and by quality and size classes. Volume by species and size classes also gives some indication of the future crop. Markets requiring white oak saw timber, for example, could not become permanently established unless the white oak sapling and pole stands contain enough trees to replace the saw timber being harvested.
4. **What is the balance between growth and drain?** Is the annual growth of species required by industries great enough to justify a larger market? What is the quality of this growth? A veneer market cannot be developed in a timbered area that is growing only low-quality wood. The present balance of growth and drain shows whether or not there is a timber surplus that can be used either for building up the growing stock or increasing the cut.
5. **How much wood of given species, size, and quality should be harvested annually?** For a region with extensive areas of mismanaged and understocked forests such as Southern Illinois, the amount that should be cut each year must be geared to the amount of timber that can be produced and the wishes of a large number of land owners. The extent to which markets and wood-using industries should be developed cannot be determined until this allowable annual cut has been established.

### FOREST AREA

Today only 26 percent of the total land area of Southern Illinois is forested, whereas the original forest of 3,276,000 acres<sup>20</sup> covered over 80 percent of the total land area (fig. 8). Of

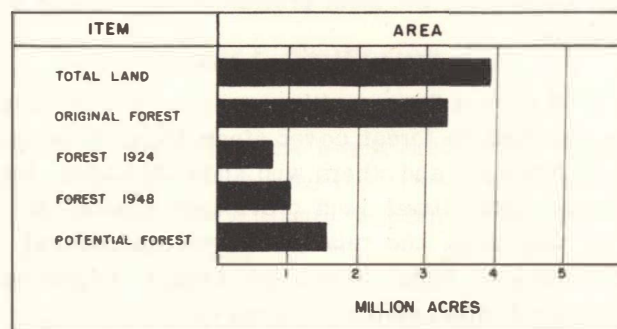


Figure 8.-- The forest area of Southern Illinois, originally just over 3 million acres, is now a little more than 1 million acres.

<sup>20</sup>Teleford, C. J. Third Report on a forest survey of Illinois. State of Illinois. 1926.



the present commercial forest of 1,030,000 acres, 736,000 acres are upland sites and 294,000 are bottomland sites (fig. 9).

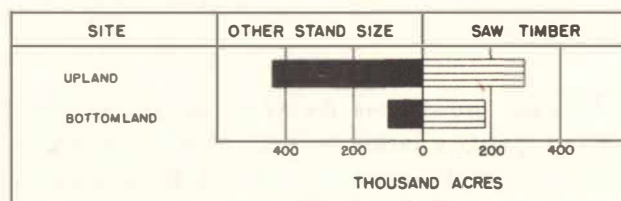


Figure 9. Upland sites have a greater forest area than bottomland sites, but have a lower proportion of that area in saw timber.

In the bottomland area, where more of the soft hardwoods suitable for container veneer, plywood core stock, and pulp are found, 64 percent of the area supports stands classified as saw timber compared to 40 percent of the upland area. The upland area runs more to oak and hickory and averages 2,040 board feet per acre compared to 3,740 board feet per acre on the bottomland area.

Based upon the productivity ratings of soil types by the Illinois Soil Survey, 30 to 40 percent of the land in Southern Illinois should be producing timber crops. In view of new agricultural practices some authorities believe this estimate is too high. In any case it seems likely that the forest area will increase. Of course, the most profitable use of land will change as agricultural and forestry research develop.

Comparisons of the 1948 Forest Survey with one completed in 1924<sup>21</sup> show that as much as 275,000 acres may have returned to forest cover since 1924. This indicated trend in land use agrees with the opinion of foresters and others who know this area. Much of this trend has been due to abandonment of poor agricultural land previously cleared for farming. Considering the rough terrain of much of this area, the relatively poor agricultural soils, and the trend from 1924 to 1948 of land returning to forest cover, wood-using industries can expect this area to always provide at least as much wood as it now does.

Each of the 16 counties has a large area in forests (fig. 10). Only five counties have less than 50,000 acres of forest land and none has less than 30,000. Though most of the forest area is in those counties containing the rough Ozark hills, a large area of forests containing bottomland tree species is found on the level, poorly drained, upland areas with clay soil. Much of this area supports pin oak in mixture with other species commonly found on poorly drained soils.

<sup>21</sup>Ibid.

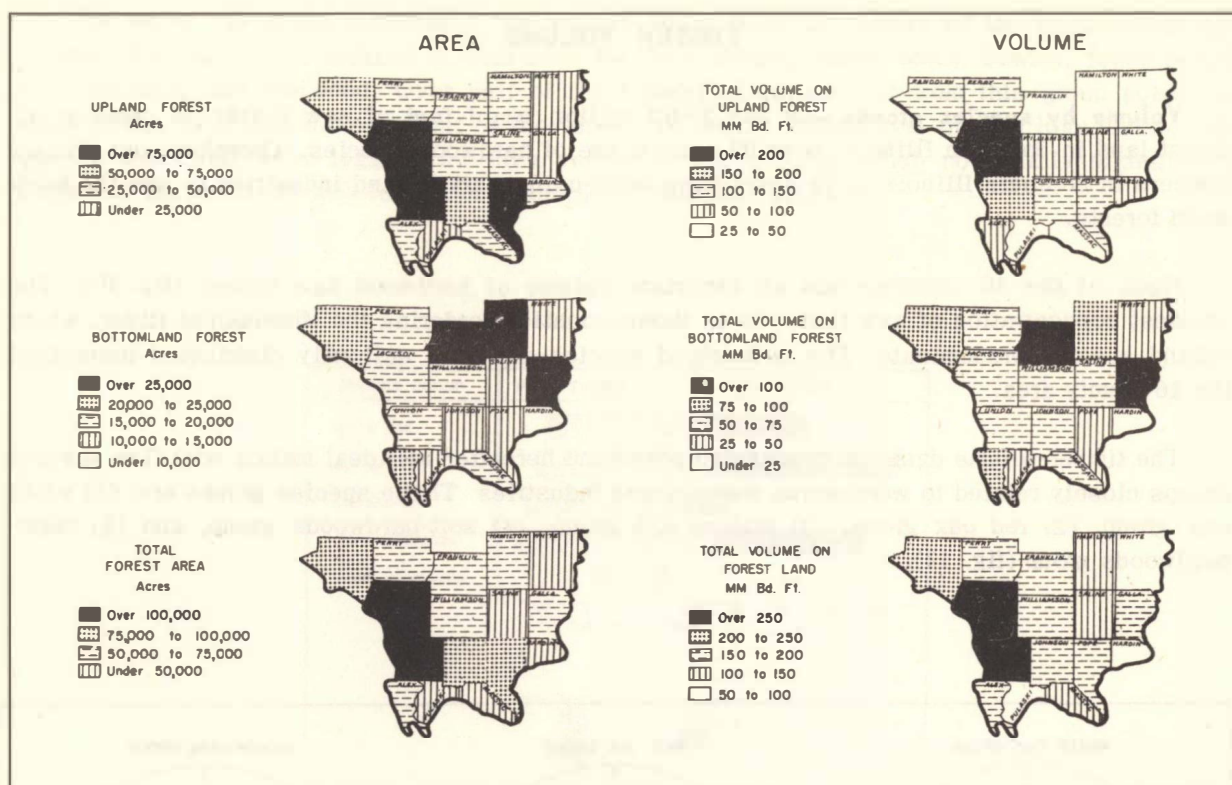


Figure 10. Each of the 16 Southern Illinois counties has a large area in forests and an important volume of hardwood saw timber.

## FOREST OWNERSHIP

Farmers own an estimated 80 percent of the forest land of the southernmost 16 counties in Illinois. The 1945 Census of Agriculture showed that about 50 percent of the 24,764 farms in Southern Illinois had woodlands. Thus, we estimate that the woodlands of this area must average about 65 acres per farm. Wood markets then, for the most part, must be supplied by small farm woodlands. According to the 1945 Census, about 40 percent of the farm land in Southern Illinois is operated by tenants. Because of the difficulty of getting land owner and wood buyer together, it is more difficult to market woodland products from tenant farms.

The Federal Government with 14 percent of the commercial forest area is the next largest owner of forest land. About 85 percent of the national forest land is in Alexander, Hardin, Jackson, Pope, and Union Counties.<sup>22</sup> Six of the 16 counties do not have publicly owned forest land. Industrial organizations own about 10,000 acres of forest.

<sup>22</sup>Spæth, J. Nelson. Southern Illinois. Chapter VII. University of Illinois Press. Urbana. 1949.



## TIMBER VOLUME

**Volume by species groups.**--Of the 2,603 million board feet of saw timber on commercial forest land in Southern Illinois, over 99 percent are of hardwood species. Therefore, our primary concern in Southern Illinois is in developing wood-using markets and industries to use the hardwood forests.

Each of the 16 counties has an important volume of hardwood saw timber (fig. 10). The greatest concentration of saw timber is in those counties bordering the Mississippi River, where upland species predominate. The bottomland species are more uniformly distributed throughout the 16-county area.

The timber-volume data and discussion presented hereafter will deal mainly with five species groups closely related to wood-using markets and industries. These species groups are: (1) white oak group, (2) red oak group, (3) hickory-ash group, (4) soft-hardwoods group, and (5) other-hardwoods group (fig. 11).

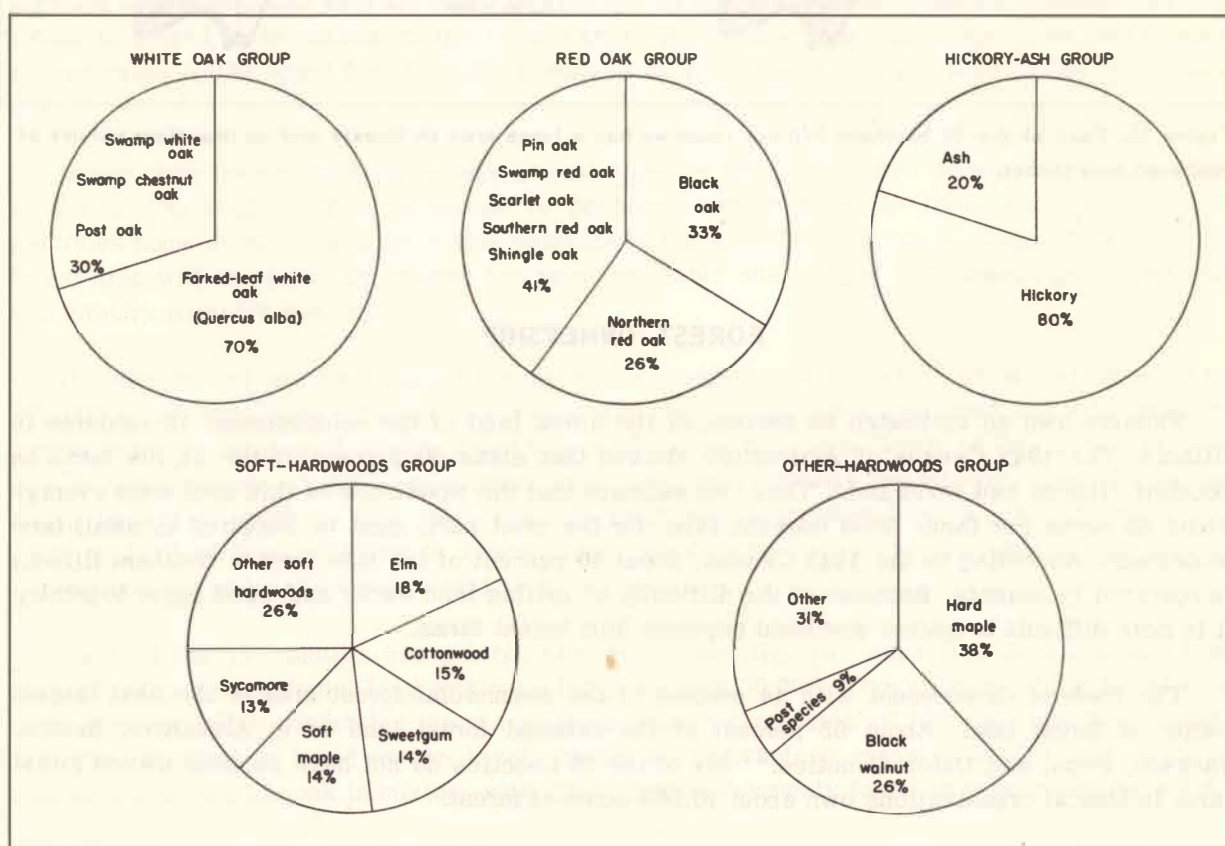


Figure 11. The proportion of saw-timber volume is shown by species for each of the five species groups.

The white oak group comprising 568 million board feet, 22 percent of the total saw-timber volume (fig. 12), is in demand in this area for face veneer, stave bolts, lumber, fence posts, mine timbers, and fuelwood. Over half of the board-foot volume cut from this group goes into stave bolts. A considerable amount of the white oak lumber comes from the top logs and poorer-quality trees left after logging for face veneer or stave bolts. Much potentially high-quality white oak timber is cut into fence posts and some into mine props.

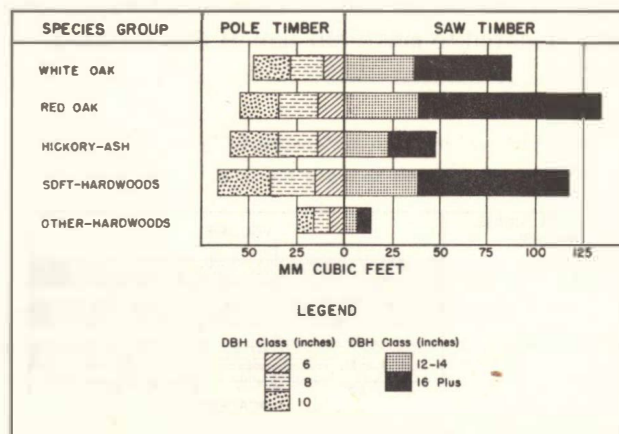


Figure 12. The saw-timber volume is greater than the pole-timber volume for all except the hickory-ash and other-hardwoods groups.

One-third of the total saw-timber volume in this area is in the red oak group which strongly supports the sawmill industry. Over 50 percent of the lumber cut comes from the red and black oaks; about 95 percent of the saw timber that was cut from the red oak group went to sawmills.

The hickory-ash group makes up only about 12 percent of the present saw-timber volume. This timber is not in much demand at present; industries that use large quantities of hickory, which makes up 80 percent of the saw timber in this group, are not available. Only a little hickory and ash goes into handle stock. More of it is cut into rough lumber for uses such as dunnage and car blocking. However, because it is hard to cut, most sawmill operators will not cut hickory unless an order requires it.

Species in the soft-hardwoods group make up nearly 30 percent of the present saw-timber volume. This group is vital to the container veneer industry which used about half of the soft-hardwood volume cut in 1947. About 30 percent of the lumber cut in 1947 was of soft-hardwoods species.



The other-hardwoods group is relatively unimportant when considering the present saw-timber volume. There is some black walnut but most of it is too small and too scattered to be an important immediate source of veneer logs. There is some hard maple but most of it is low quality.

The amount of timber of each species group in certain diameter classes indicates the character of the future timber stand (fig. 13). The white oak, red oak, hickory-ash, and soft-hardwoods groups comprise fairly equal proportions of the pole stand. The hickory-ash group makes up a larger share of the present pole stand than it does of the present saw-timber stand, while just the reverse is true of the white oak and red oak groups. Because of this, the hickory-ash group will be a more important crop in the future than it is now. However, present local markets and wood-using industries are not prepared to make full use of this material.

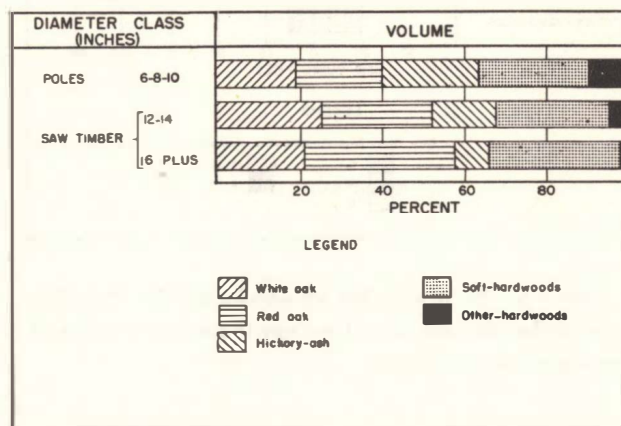


Figure 13. The hickory-ash group makes up a larger share of the present pole stand than it does of the saw-timber stand. Because of this, it should be a more important crop in the future.

Though the volume of the other-hardwoods group makes up a greater proportion of the pole stands than it does of the saw-timber stand, it is still a relatively unimportant part of the total volume. Much of it is post species which will be cut before reaching saw-timber size.

**Volume by log grade.**--Though high-quality logs are available, especially in the red oak group, the volume of grade 3 logs far outweighs the volume in the better-grade 1 and 2--logs (fig. 14). About 80 percent of the saw-timber volume is in low-grade logs suitable mainly for such products as rough construction lumber, railroad cross ties, crating, pallets, and car blocking. Not included in figure 14 are an additional 134 million cubic feet of sound material contained in cull trees.

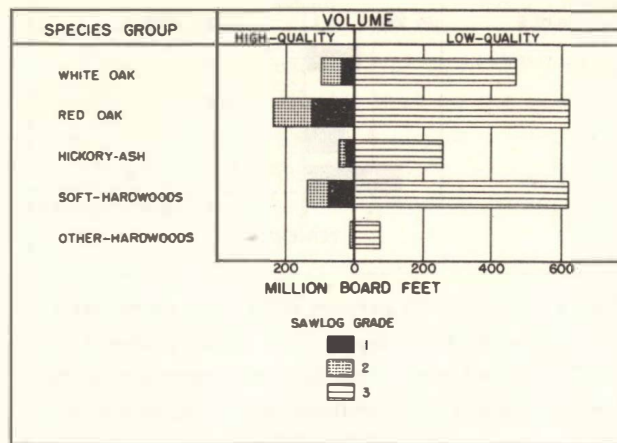


Figure 14. In all species groups low-quality sawtimber volume is much greater than high-quality.

This large volume of low-quality and cull material presents a major problem in managing the forest and in harvesting, utilizing, and marketing the timber crop. The woodlands cannot be managed to the best advantage unless much of the low-quality and cull material is removed to make way for better growing stock. Yet there is little likelihood that much of this material will be removed until ways of harvesting, manufacturing, and marketing are developed that will pay for its removal. For this reason, more research is needed to develop new uses and outlets for low-quality wood and to find cheaper ways of handling it. There is a ready market for high-quality wood. The marketing problem here is to keep the high-quality wood channeled to uses for which it is best suited. Too often small sawmills are found cutting high-quality logs for purposes which low-quality logs could serve as well.

Because of the way in which log grades are set up, trees less than 15 inches d.b.h. contain only inferior (grade 3) logs. Many of these trees will produce high-quality logs if left to grow to a large diameter.

About 35 percent of the volume of trees in the 18-inch diameter class and above is in the higher-valued log grades (fig. 15). These higher-grade logs are important to the lumber industry as well as the veneer, stave, and handle manufacturers. For example, for most important species in this region, over 50 percent of the lumber cut from grade 1 and 2 logs will be number one common and better in grade, while only about 20 percent of the lumber cut from grade 3 logs will be of that quality.<sup>23</sup> Of the red oak group, which largely supports the lumber industry, over 40 percent of the volume of trees of the 18-inch diameter group and above is in log grades 1 and 2. Face-veneer manufacturers, stave producers, and container veneer manufacturers also want large timber in white oak, red oak, and soft-hardwood species in order to manufacture products of the highest quality

<sup>23</sup>U.S. Forest Service. Sawlog grades for hardwoods—central states studies. Prod. Lab. Rpt. No. D 1699. 1947.



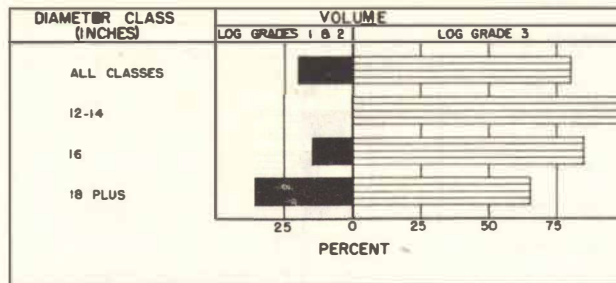


Figure 15. About 35 percent of the volume of trees 18 or more inches in diameter is in log grades 1 and 2. These higher-grade logs are important to the lumber industry and manufacturers of high-quality wood products.

## TIMBER GROWTH

**Board-foot growth.**--More than 103 million board feet of saw timber were grown on the commercial forests of Southern Illinois in 1947. As a group, the soft-hardwoods made the greatest net growth, accounting for more than 37 million board feet of the total (fig. 16). The per-acre net growth for all saw timber was 100 board feet.

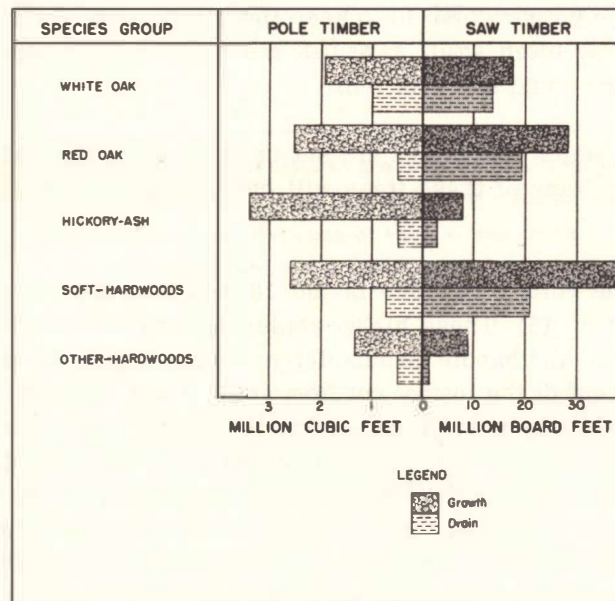


Figure 16. In 1947 growth exceeded drain for all species groups. However, this was not true of high-quality growth.

The ratio between the annual growth and the volume of individual trees gets smaller as the tree diameter increases. However, because of the greater growing surface, actual volume growth on the larger trees may be just as great or greater than on the smaller. The growth of the larger diameter classes will be more valuable because high-quality products can be cut from large-diameter trees. In 1947 the stands grew about 21 million board feet in log grades 1 and 2 (fig. 17). All of this growth--about one-fifth of the total--was on trees in the 16-inch diameter class and larger.

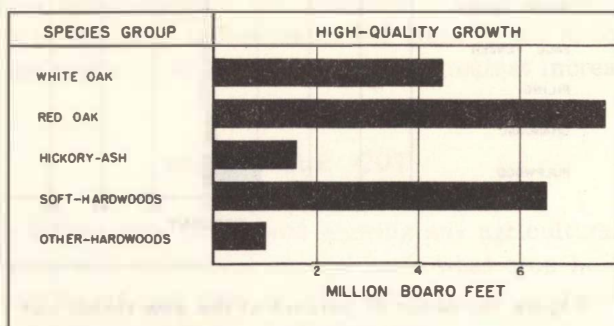


Figure 17. In 1947 Southern Illinois stands grew about 21 million board feet in high-quality logs (grades 1 and 2).

**Cubic-foot growth.**--In addition to the saw-timber growth the forests of Southern Illinois produced nearly 12 million cubic feet of pole timber. Over 3 million cubic feet of this growth were in the hickory-ash group (fig. 16).

## TIMBER DRAIN

**Board-foot drain.**--About 57 million board feet of saw-timber were cut in 1947 from the forests of Southern Illinois. Over 90 percent of this drain came from the soft-hardwoods, red oak, and white oak groups (fig. 16).

About 60 percent of the saw timber drain was used for lumber (fig. 18). Of the lumber cut, about two-thirds came from the oaks, of which about 85 percent was red and black oak. An additional 30 percent of the saw timber went into container veneer and cooperage.

More than 27 million board feet of grade 1 and 2 logs were used in 1947. In other words, nearly 50 percent of the saw-timber drain was in high-quality logs. Over 75 percent of the low-quality saw-timber drain was cut into lumber.



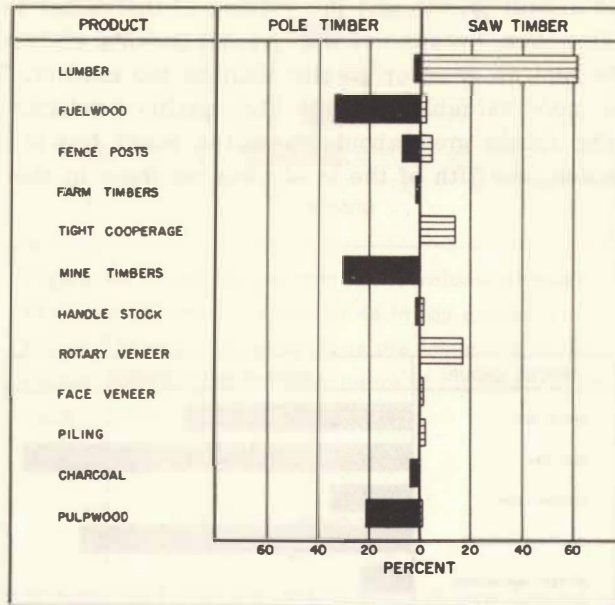


Figure 18. About 60 percent of the saw timber cut in 1947 was used for lumber. Fuelwood, mine timbers, and pulpwood accounted for most of the pole timber cut.

**Cubic-foot drain.**--In addition to the saw timber that was cut, about 3 million cubic feet were cut from pole timber. About 50 percent of the pole-timber drain came from the red and white oak groups (fig. 16). The pole timber was used mainly for fuelwood, mine props, and pulpwood.

### GROWTH-DRAIN COMPARISON

**Board-foot growth-drain balance.**--Saw-timber growth exceeded drain in 1947 by 46½ million board feet, the equivalent of about 45 board feet per acre of commercial forest land. Saw-timber growth in 1947 exceeded drain in all species groups (fig. 16).

Though the total saw-timber growth exceeded drain, this was not true of high-quality saw timber. For the year 1947, the drain of high-quality wood of all species exceeded the growth by about 30 percent. Considering the large size of the growing stock in relation to the drain, a 30 percent overcut for one year may not be serious. However, there is reason to believe that the 1947 drain is about average for the years 1940 to 1950.

Even more serious is the overcut of the high-quality timber in white oak and soft-hardwoods groups. In 1947 the cooperage industry used nearly 8 million board feet of white oak; most of this was in grade 1 and 2 logs. Yet, only about 4½ million board feet of this material were grown during that period.

The container veneer industry and sawmill industry together used about 11 million board feet of high-quality soft hardwoods. Only about 7 million board feet of this quality were grown in the soft-hardwoods group.

The growth and drain of high-quality timber in the red oak group are about in balance.

**Cubic-foot growth-drain balance.**---The net increase of pole timber in 1947 was over 8½ million cubic feet. Growth of the pole timber exceeded drain in all species groups. Of this on-coming saw-timber crop, the hickory-ash group showed the greatest increase of growth over drain.

### ALLOWABLE CUT

Growing a timber crop differs very little from growing any agricultural crop. The wise farmer determines what kind of crop will grow best on his land, what crop he has the best market for, and grows as much as possible of that crop on each acre. Each year he harvests the amount he is able to grow.

Growing a timber crop differs mainly from growing most agricultural crops in that it takes several years to grow trees to harvest size. The forest manager still has to decide what timber crop will grow best on his land, what timber crop he has the best market for, and then has to manage that crop to grow as much as possible on each acre. After the timber stand reaches optimum stocking and maximum growth, the forest manager can harvest periodically or annually the amount of timber grown during that period. This harvest is the allowable periodic or annual cut.

While the forest manager is developing his timber crop to attain optimum stocking and maximum growth, the allowable cut may be more or less than the growth, depending upon the character and condition of the timber stand and how soon the goal is to be reached.

An accurate determination of allowable cut cannot be made for unmanaged forest areas made up of many small ownerships, such as are found in Southern Illinois. If the forest areas of Southern Illinois were composed of fully stocked, uneven-aged forests producing maximum growth of high-quality timber, the allowable cut could equal the growth. However, a number of factors complicate any attempt to arrive at a realistic estimate of an allowable cut for Southern Illinois forests:

1. **The total forest area is made up of many forests** in various stages of development or deterioration and is operated by many owners. Thousands of individual owners cannot be expected to accept a unified forest management plan. The problems of each owner will be different, requiring a wide variation in individual management plans. Total allowable cut could only be determined after arriving at an allowable cut for each individual area.



2. **The forests as a whole are understocked.** Although during recent years the forest growing stock has been gradually increasing, the forests still contain only about one-third of the saw-timber volume needed to produce maximum timber growth.
3. **High-quality saw timber is now being cut faster than it is being grown** in order to sustain industries. It would be desirable to reduce the cut of high-quality timber to less than the amount grown annually, if this could be done without seriously affecting the economy of the region. This would build up the forest growing stock and allow, eventually, greater cuts of high-quality timber. It would, however, curtail the industries now using high-quality timber and would result in loss of wages and income in the region.
4. **A large amount of growing space is occupied by cull and low-quality trees** which should be removed to allow space for optimum stocking and maximum growth of higher-quality timber. To improve the stands, all the cull and low-quality trees which have no possibility of growing into high quality should be cut. To the extent industries can be developed to use this class of material, they will offset the loss to the region in high-quality industries mentioned above.
5. **The economy of this region needs the employment and added income new or expanded wood-using industries would produce.** If markets were available for the low-quality material now growing in Southern Illinois, the cut could be greatly increased beyond that of 1947. This increased cut would permit wood-using industries to expand and at the same time prepare the forests for a greater volume and growth of higher-quality timber of better species.

Preferably, the annual cut of high-quality logs (logs that now qualify or may eventually grow into grade 1 or 2 sawlogs) should not exceed the estimated present annual growth of 21 million board feet of this material. Because existing industries now cut more than 27 million board feet of high-quality material, they should reconsider their needs to see if lower-quality timber can be used in some cases.

The allowable cut of low-grade sawlog material, on the other hand, can exceed growth. The forests of Southern Illinois contain over 1 billion board feet of grade 3 sawlog material which is not likely to grow into higher-quality sawlogs. In addition there is about 134 million cubic feet (the equivalent of over three-fourths billion board feet) of sound wood contained in cull trees. It would take 100 mills each capable of using 1 million board feet annually nearly 20 years to use this volume of low-quality wood.

Considering this large volume of low-quality wood, much of which should be removed to make room for better-quality timber, the allowable annual cut of low-quality timber could probably be about 200 million board feet for the next 10 years.

The key to the situation lies in finding markets for this low-quality material and developing methods of logging and processing it at competitive prices. Sawmill operators and other users will buy low-quality stumpage and logs if they have a market for the products which can be produced from it and if the price permits a reasonable profit. However, because the cost of manufacturing most products from low-quality timber is greater than from high-quality timber, it will be difficult to substantially increase the use of low-quality wood.

## RECOMMENDATIONS FOR IMPROVING THE MARKETING OF WOODLAND PRODUCTS

We have pointed out (1) the importance of Southern Illinois woodlands to farmers, laborers, and industry, (2) the need in Southern Illinois for more job opportunities, (3) the favorable overall growth-drain balance of the woodlands in this area, (4) the large volume of low-quality wood which should be removed from the stands in order to increase the growth of high-quality timber, (5) the lack of local markets for some forest products, and (6) the small amount of lumber processing and wood remanufacturing that takes place in the area. It is apparent that Southern Illinois needs to develop wood markets, marketing procedures, and wood-processing and remanufacturing plants. The following recommendations are made to this end:

**Expand local processing of lumber and local wood remanufacturing.**--Instead of selling rough, green, mill-run lumber, this region needs the facilities to produce such semiprocessed or finished products as dry, graded lumber, furniture squares, handle blanks, veneer, and plywood. As a matter of fact, there is opportunity here for many small plants manufacturing finished products such as furniture, novelties, athletic goods, and handles. These plants would provide a steady, sure market for the lumber and other forest products produced in the region.

The wood is available. The problem, then, is one of getting capital, developing outlets for the manufactured products, and producing and marketing the finished items as efficiently and economically as can be done elsewhere.

**Develop new marketing facilities.**--Woodland owners are often unable to sell small quantities of either high- or low-quality timber advantageously. Concentration yards, "milk-route" pick-ups, and cooperatives, which could handle both large and small quantities of logs, bolts, and lumber, should be developed to market timber more effectively. These facilities, by channeling logs and bolts to their highest use, would obtain greater returns from the sale of forest products.

**Expand markets for low-quality timber.**--A large reservoir of potentially usable low-quality timber is taking up forest growing space that could better be occupied by more valuable trees. Its removal from the forest would not only free forest growing space but could provide a resource to support industries badly needed in this region.

As new equipment is developed to handle wood products more cheaply and rapidly, it may become profitable to harvest, transport, and process this low-quality timber. Already new processes are making possible the use of hardwoods of this region for items formerly made of other materials; wood insulation, wood pulp, building board, roofing paper, and corrugating board are examples.

This recommendation is highly important and probably should be considered first. However, it is unlikely that low-quality timber can be used successfully until ways and means are found to channel high-quality timber to high-valued uses only. As long as high-quality timber is available for low-valued products at a price the producer is willing to pay, very little low-quality timber will be used.



**Encourage permanent wood markets through a dependable production of woodland products.--** Stable forest-product industries must be sure of an adequate supply of raw material. A region can build up such a supply by protecting forests from fire and grazing damage, by replacing cull and defective trees with thrifty, well-formed trees, by thinning, and by other forest management practices. Far-sighted industrial operators are already managing their own woodlands and are contracting for the sustained annual production of other woodland owners. These practices, if generally followed by operators in the region, would tend to assure a balance of cut with growth, and would do much to encourage permanent wood markets.

**Provide more marketing information.--**To market his woodland products to the best advantage, the owner should have current and detailed information concerning (1) the location of markets, (2) prices, (3) kinds of timber wanted, (4) grades and qualities accepted, and (5) cutting specifications for logs and bolts.

Some procedure must be set up to obtain this information and make it available. At present the farm foresters, extension foresters, and others provide as much of this information as they can. However, there are not enough of these agents, nor do they have enough published information concerning current markets, prices, and specifications.

This service should be broad enough to provide information for timber buyers, sawmill operators, and wood remanufacturers concerning the markets for their products. Often the market is poor for standing timber because the sawmill operator or other wood-product manufacturer doesn't have the answer to his marketing problem. Most of these industries are small and cannot support an active sales organization. Too often the owner must help operate the mill as well as handle business dealings. As a result, most of these operators depend upon local, often seasonal, markets. When these markets fail, the operator does not know where or how to look for a new market. At first the facilities of research and extension agencies will be needed to set up a system of obtaining and publishing marketing information. Eventually, farm journals, newspapers, and radio stations may be used to publish the information.

**Intensify research and extension work.--**Research on the economics of harvesting and marketing farm woodland products in this region should be speeded up to give the farmers as much information as possible before the young stands now reaching merchantable size are harvested and while demand and prices are good. Actual on-the-ground studies should develop better methods of timber harvesting and marketing and should determine costs and returns.

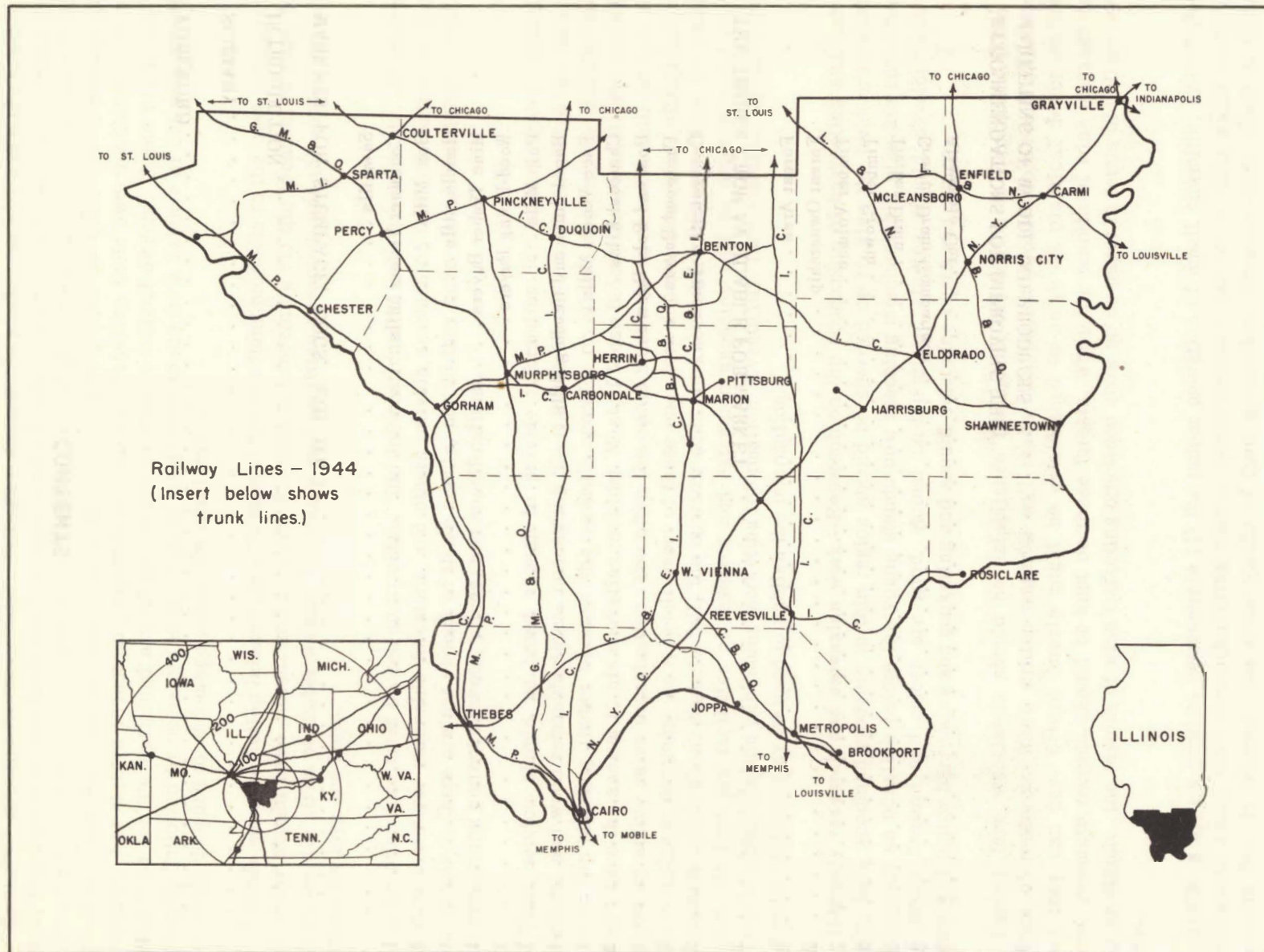
Sample farm woodlands should be established throughout the region to demonstrate the results of research. While written material will reach many, most people more readily accept what they can see. School forests might be established to serve as practical demonstration areas. Accurate records should be kept on these forests. While the results of wise management may be visible, the results of wise marketing practices show up on paper in terms of dollars and cents.

There is also a need to demonstrate (1) the proper operation of small sawmills, and (2) the operation of small wood-remanufacturing plants. Demonstrations can show many small sawmill operators how to increase the grade yields of their production. Because many small sawmill

## CONTENTS

	Page
FOREWORD . . . . .	i
SUMMARY . . . . .	1
INTRODUCTION . . . . .	2
MARKETS FOR STUMPAGE, LOGS, AND BOLTS . . . . .	6
Sawmills . . . . .	6
Container Veneer Mills . . . . .	11
Box Mills . . . . .	13
Handle Mills . . . . .	14
Mine Timber Buyers . . . . .	14
Wood-Piling Buyers . . . . .	15
Pulp Mills . . . . .	16
Barrel Stave and Heading Mills . . . . .	17
Face-Veneer Mills . . . . .	19
Charcoal Kilns . . . . .	20
Post and Pole Buyers . . . . .	20
Fuelwood Buyers . . . . .	22
Concentration Yards . . . . .	23
THE TIMBER CROP AVAILABLE FOR MARKET . . . . .	24
Forest Area . . . . .	25
Forest Ownership . . . . .	27
Timber Volume . . . . .	28
Timber Growth . . . . .	32
Timber Drain . . . . .	33
Growth-Drain Comparison . . . . .	34
Allowable Cut . . . . .	35
RECOMMENDATIONS FOR IMPROVING THE MARKETING OF WOODLAND PRODUCTS . . . . .	37





Frontispiece.--Southern Illinois, its railway system and trunk-line.

## RECOMMENDATIONS FOR IMPROVING THE MARKETING OF WOODLAND PRODUCTS

We have pointed out (1) the importance of Southern Illinois woodlands to farmers, laborers, and industry, (2) the need in Southern Illinois for more job opportunities, (3) the favorable overall growth-drain balance of the woodlands in this area, (4) the large volume of low-quality wood which should be removed from the stands in order to increase the growth of high-quality timber, (5) the lack of local markets for some forest products, and (6) the small amount of lumber processing and wood remanufacturing that takes place in the area. It is apparent that Southern Illinois needs to develop wood markets, marketing procedures, and wood-processing and remanufacturing plants. The following recommendations are made to this end:

**Expand local processing of lumber and local wood remanufacturing**--Instead of selling rough, green, mill-run lumber, this region needs the facilities to produce such semiprocessed or finished products as dry, graded lumber, furniture squares, handle blanks, veneer, and plywood. As a matter of fact, there is opportunity here for many small plants manufacturing finished products such as furniture, novelties, athletic goods, and handles. These plants would provide a steady, sure market for the lumber and other forest products produced in the region.

The wood is available. The problem, then, is one of getting capital, developing outlets for the manufactured products, and producing and marketing the finished items as efficiently and economically as can be done elsewhere.

**Develop new marketing facilities**.--Woodland owners are often unable to sell small quantities of either high- or low-quality timber advantageously. Concentration yards, "milk-route" pick-ups, and cooperatives, which could handle both large and small quantities of logs, bolts, and lumber, should be developed to market timber more effectively. These facilities, by channeling logs and bolts to their highest use, would obtain greater returns from the sale of forest products.

**Expand markets for low-quality timber**.--A large reservoir of potentially usable low-quality timber is taking up forest growing space that could better be occupied by more valuable trees. Its removal from the forest would not only free forest growing space but could provide a resource to support industries badly needed in this region.

As new equipment is developed to handle wood products more cheaply and rapidly, it may become profitable to harvest, transport, and process this low-quality timber. Already new processes are making possible the use of hardwoods of this region for items formerly made of other materials; wood insulation, wood pulp, building board, roofing paper, and corrugating board are examples.

This recommendation is highly important and probably should be considered first. However, it is unlikely that low-quality timber can be used successfully until ways and means are found to channel high-quality timber to high-valued uses only. As long as high-quality timber is available for low-valued products at a price the producer is willing to pay, very little low-quality timber will be used.



**Encourage permanent wood markets through a dependable production of woodland products.--**

Stable forest-product industries must be sure of an adequate supply of raw material. A region can build up such a supply by protecting forests from fire and grazing damage, by replacing cull and defective trees with thrifty, well-formed trees, by thinning, and by other forest management practices. Far-sighted industrial operators are already managing their own woodlands and are contracting for the sustained annual production of other woodland owners. These practices, if generally followed by operators in the region, would tend to assure a balance of cut with growth, and would do much to encourage permanent wood markets.

**Provide more marketing information.--**To market his woodland products to the best advantage, the owner should have current and detailed information concerning (1) the location of markets, (2) prices, (3) kinds of timber wanted, (4) grades and qualities accepted, and (5) cutting specifications for logs and bolts.

Some procedure must be set up to obtain this information and make it available. At present the farm foresters, extension foresters, and others provide as much of this information as they can. However, there are not enough of these agents, nor do they have enough published information concerning current markets, prices, and specifications.

This service should be broad enough to provide information for timber buyers, sawmill operators, and wood remanufacturers concerning the markets for their products. Often the market is poor for standing timber because the sawmill operator or other wood-product manufacturer doesn't have the answer to his marketing problem. Most of these industries are small and cannot support an active sales organization. Too often the owner must help operate the mill as well as handle business dealings. As a result, most of these operators depend upon local, often seasonal, markets. When these markets fail, the operator does not know where or how to look for a new market. At first the facilities of research and extension agencies will be needed to set up a system of obtaining and publishing marketing information. Eventually, farm journals, newspapers, and radio stations may be used to publish the information.

**Intensify research and extension work.--**Research on the economics of harvesting and marketing farm woodland products in this region should be speeded up to give the farmers as much information as possible before the young stands now reaching merchantable size are harvested and while demand and prices are good. Actual on-the-ground studies should develop better methods of timber harvesting and marketing and should determine costs and returns.

Sample farm woodlands should be established throughout the region to demonstrate the results of research. While written material will reach many, most people more readily accept what they can see. School forests might be established to serve as practical demonstration areas. Accurate records should be kept on these forests. While the results of wise management may be visible, the results of wise marketing practices show up on paper in terms of dollars and cents.

There is also a need to demonstrate (1) the proper operation of small sawmills, and (2) the operation of small wood-remanufacturing plants. Demonstrations can show many small sawmill operators how to increase the grade yields of their production. Because many small sawmill

operators in the area produce rough, mill-run lumber, they must rely chiefly on local markets. The production of better manufactured lumber together with concentration-yard facilities previously mentioned, should enable lumber from this region to compete more successfully on the national market. There is a place for some wood remanufacturing equipment at many sawmills. The advantage and use of this equipment should be demonstrated.

Further, there is a need for a small pilot plant, independent of the sawmill which can show how to remanufacture lumber into finished products and to market them. The successful operation of such remanufacturing plants on a commercial basis can do much toward stabilizing wood markets in Southern Illinois as well as providing much needed employment and added income.